

Code: 22MEMD2T4

I M.Tech - II Semester – Regular Examinations - JULY - 2023**ADVANCED ROBOTICS
(MACHINE DESIGN)**

Duration: 3 hours

Max. Marks: 60

Note: 1. This paper contains 4 questions from 4 units of Syllabus. Each unit carries 15 marks and have an internal choice of Questions.

2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

		BL	CO	Max. Marks
UNIT-I				
1	Sketch line diagram of a Polar Coordinate Robot and Evaluate its features along with Advantageous and Disadvantageous.	L3	CO1	15 M
OR				
2	Explain the matrix representation of a frame relative to a fixed reference frame. Discuss about transformations relative to the rotating frame.	L2	CO1	15 M
UNIT-II				
3	What is the role of D-H notation? Explain their importance in solving Forward Kinematics with an example.	L2	CO2	15 M
OR				
4	How velocity Jacobian matrix does come into picture in static analysis?	L2	CO2	15 M

UNIT-III				
5	Determine the equations of motion for 2DOF RR- planar manipulator arm using Lagrange-Euler Formulation.	L2	CO3	15 M
OR				
6	What do you mean by joint space trajectory planning? State how the joint space trajectory can be established for a required tool space trajectory.	L2	CO3	15 M
UNIT-IV				
7	Explain in detail about proportional, PI and PID controllers.	L3	CO4	15 M
OR				
8	Explain any three position sensors with their application which are used in robotics.	L3	CO4	15 M